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<input type="checkbox"/>	L6	L5 not l2	10
<input type="checkbox"/>	L5	L3 and glycosyl	14
<input type="checkbox"/>	L3	WITHERS.IN.	744
<input type="checkbox"/>	L2	L1 WITH (RETAINING OR INVERTING)	4
<input type="checkbox"/>	L1	(GLYCOSIDASE OR GLYCOSYL) WITH (MUTA\$4 OR VARIANT)	543

END OF SEARCH HISTORY

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Search Results - Record(s) 1 through 4 of 4 returned.

☐ 1. Document ID: US 20030138880 A1

Using default format because multiple data bases are involved.

L2: Entry 1 of 4

File: PGPB

Jul 24, 2003

PGPUB-DOCUMENT-NUMBER: 20030138880

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030138880 A1

TITLE: Solid-phase synthesis of oligosaccharides and glycopeptides using glycosynthases

PUBLICATION-DATE: July 24, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Withers, Stephen G.	Vancouver		CA
Jensen, Knud J.	Copenhagen		DK
Petersen, Lars	Copenhagen		DK
Tolborg, Jakob L.	Ballerup		DK

US-CL-CURRENT: [435/68.1](#); [435/101](#), [435/85](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw De
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☐ 2. Document ID: US 20030100749 A1

L2: Entry 2 of 4

File: PGPB

May 29, 2003

PGPUB-DOCUMENT-NUMBER: 20030100749

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030100749 A1

TITLE: Methods and compositions for synthesis of oligosaccharides using mutant glycosidase enzymes

PUBLICATION-DATE: May 29, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Withers, Stephen G.	Vancouver		CA
MacKenzie, Lloyd	Vancouver		CA

Wang, Qingping

Kirkland

CA

US-CL-CURRENT: 536/123.1; 435/100, 435/101, 435/201, 536/123.13

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 3. Document ID: US 6284494 B1

L2: Entry 3 of 4

File: USPT

Sep 4, 2001

US-PAT-NO: 6284494

DOCUMENT-IDENTIFIER: US 6284494 B1

TITLE: Methods and compositions for synthesis of oligosaccharides using mutant glycosidase enzymes

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
------	-------	----------	-------	--------	----------------	------	-----------	-----------	-------------	--------	------	--------

☐ 4. Document ID: US 5716812 A

L2: Entry 4 of 4

File: USPT

Feb 10, 1998

US-PAT-NO: 5716812

DOCUMENT-IDENTIFIER: US 5716812 A

TITLE: Methods and compositions for synthesis of oligosaccharides, and the products formed thereby

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Terms	Documents
L1 WITH (RETAINING OR INVERTING)	4

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Search Results - Record(s) 1 through 10 of 10 returned.

☐ 1. Document ID: US 20040096951 A1

Using default format because multiple data bases are involved.

L6: Entry 1 of 10

File: PGPB

May 20, 2004

PGPUB-DOCUMENT-NUMBER: 20040096951

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040096951 A1

TITLE: Crystal structures of retaining glycosyltransferases

PUBLICATION-DATE: May 20, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
<u>Withers</u> , Stephen G.	Vancouver		CA
Wakarchuk, Warren W.	Gloucester		CA
Strynadka, Natalie C.J.	Vancouver		CA
Dieckelmann, Manuela	Brisbane		AU
Ly, Hoa	Kitchener Ontario		CA
Persson, Karina	Vancouver		CA

US-CL-CURRENT: 435/193; 435/87, 536/53

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw. De
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☐ 2. Document ID: US 6204029 B1

L6: Entry 2 of 10

File: USPT

Mar 20, 2001

US-PAT-NO: 6204029

DOCUMENT-IDENTIFIER: US 6204029 B1

TITLE: Glycosylated acceptor synthesis catalyzed by glycosyl transferase and nucleotide phosphate sugar-dependent enzyme

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw. De
------	-------	----------	-------	--------	----------------	------	-----------	-----------	-------------	--------	------	----------

☐ 3. Document ID: US 5952203 A

L6: Entry 3 of 10

File: USPT

Sep 14, 1999

US-PAT-NO: 5952203

DOCUMENT-IDENTIFIER: US 5952203 A

TITLE: Oligosaccharide synthesis using activated glycoside derivative, glycosyl
transferase and catalytic amount of nucleotide phosphate

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawn De
------	-------	----------	-------	--------	----------------	------	-----------	-----------	-------------	--------	------	----------

☐ 4. Document ID: WO 2005040371 A1

L6: Entry 4 of 10

File: EPAB

May 6, 2005

PUB-NO: WO2005040371A1

DOCUMENT-IDENTIFIER: WO 2005040371 A1

TITLE: ENGINEERED ENZYMES AND THEIR USE FOR SYNTHESIS OF THIOLYGLYCOSIDES

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawn De
------	-------	----------	-------	--------	----------------	------	-----------	-----------	-------------	--------	------	----------

☐ 5. Document ID: EP 1211320 A2

L6: Entry 5 of 10

File: EPAB

Jun 5, 2002

PUB-NO: EP001211320A2

DOCUMENT-IDENTIFIER: EP 1211320 A2

TITLE: Methods and compositions for synthesis of oligosaccharides using mutant
glycosidase enzymes

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawn De
------	-------	----------	-------	--------	----------------	------	-----------	-----------	-------------	--------	------	----------

☐ 6. Document ID: WO 9846784 A1

L6: Entry 6 of 10

File: EPAB

Oct 22, 1998

PUB-NO: WO009846784A1

DOCUMENT-IDENTIFIER: WO 9846784 A1

TITLE: IMPROVED SYNTHESIS OF OLIGOSACCHARIDES USING ACTIVATED GLYCOSIDE DERIVATIVES

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawn De
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☐ 7. Document ID: WO 9721822 A2

L6: Entry 7 of 10

File: EPAB

Jun 19, 1997

PUB-NO: WO009721822A2

DOCUMENT-IDENTIFIER: WO 9721822 A2

TITLE: METHODS AND COMPOSITIONS FOR SYNTHESIS OF OLIGOSACCHARIDES USING MUTANT
GLYCOSIDASE ENZYMES

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Drawn De
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☐ 8. Document ID: WO 2005040371 A1

L6: Entry 8 of 10

File: DWPI

May 6, 2005

DERWENT-ACC-NO: 2005-346731

DERWENT-WEEK: 200535

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TITLE: Novel thioglycosynthases obtained from wild type by converting its catalytically active amino acids serving as acid/base catalyst and as catalytic nucleophile, to some other amino acid, useful for synthesizing thioglycoside

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Draw D
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☐ 9. Document ID: US 6204029 B1

L6: Entry 9 of 10

File: DWPI

Mar 20, 2001

DERWENT-ACC-NO: 2001-307169

DERWENT-WEEK: 200132

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TITLE: Composition for forming a glycosylated acceptor, comprising an activated glycoside derivative, a mutant glycosyl transferase, an acceptor substrate and a nucleotide phosphate

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Draw D
------	-------	----------	-------	--------	----------------	------	-----------	-----------	-------------	--------	------	--------

☐ 10. Document ID: MX 212201 B, WO 9846784 A1, AU 9870204 A, US 5952203 A, EP 973932 A1, MX 9909281 A1, AU 739383 B, JP 2001519669 W

L6: Entry 10 of 10

File: DWPI

Dec 17, 2002

DERWENT-ACC-NO: 1998-583289

DERWENT-WEEK: 200413

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TITLE: Preparation of glycosylated acceptors for use as donor sugars in oligosaccharide synthesis - by admixing activated glycoside derivative e.g. glycosyl fluoride, acceptor substrate e.g. lactose glycosyl transferase e.g. alpha-sialyl transferase and nucleotide phosphate analogues in aqueous medium

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Draw D
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Clear	Generate Collection	Print	Fwd Refs	Bkwd Refs	Generate OACS
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Terms	Documents
L5 not L2	10

Display Format:

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NEWS 6 AUG 30 CASREACT - Enhanced with displayable reaction conditions
NEWS 7 SEP 09 ACD predicted properties enhanced in REGISTRY/ZREGISTRY
NEWS 8 OCT 03 MATHDI removed from STN
NEWS 9 OCT 04 CA/CAPplus-Canadian Intellectual Property Office (CIPO) added
to core patent offices
NEWS 10 OCT 06 STN AnaVist workshops to be held in North America
NEWS 11 OCT 13 New CAS Information Use Policies Effective October 17, 2005
NEWS 12 OCT 17 STN(R) AnaVist(TM), Version 1.01, allows the export/download
of CAPplus documents for use in third-party analysis and
visualization tools

NEWS EXPRESS JUNE 13 CURRENT WINDOWS VERSION IS V8.0, CURRENT
MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),
AND CURRENT DISCOVER FILE IS DATED 13 JUNE 2005

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FULL ESTIMATED COST	0.21	0.21

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=> s (glycosidase or glycosyl) (5a) (muta? or variant)
L1 817 (GLYCOSIDASE OR GLYCOSYL) (5A) (MUTA? OR VARIANT)

=> s l1(5a) (retaining or inverting)
L2 41 L1(5A) (RETAINING OR INVERTING)

=> dup rem l2
PROCESSING COMPLETED FOR L2
L3 12 DUP REM L2 (29 DUPLICATES REMOVED)

=> d 1-10

L3 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:1023269 HCAPLUS
DN 143:301353
TI Anomer- ***retaining*** ***glycosyl*** hydrolase ***mutant***
and its production method by cysteine substitution followed by oxidation
to cysteine sulfinic acid or cysteine sulfonic acid
IN Saburi, Wataru; Mori, Haruhide; Okuyama, Masayuki; Kimura, Atsuo;
Yamamoto, Takeshi; Ogawa, Koichi
PA Nihon Shokuhin Kako Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 25 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005253302	A2	20050922	JP 2004-61180	20040304
PRAI	JP 2004-61180		20040304		

L3 ANSWER 2 OF 12 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
AN 2005-17922 BIOTECHDS
TI Thermus thermophilus glycosynthases for the efficient synthesis of
galactosyl and glucosyl beta-(1 -andgt; 3)-glycosides;
bacterium recombinant enzyme production and transglycosidation for use
in oligosaccharide production
AU DRONE J; FENG HY; TELLIER C; HOFFMANN L; TRAN V; RABILLER C; DION M
CS Univ Sci and Technol
LO Dion M, Fac Sci and Tech, CNRS, UMR 6204, 2 Rue Houssiniere, BP 92208,
F-44322 Nantes, France
SO EUROPEAN JOURNAL OF ORGANIC CHEMISTRY; (2005) , 10, 1977-1983 ISSN:
1434-193X
DT Journal
LA English

L3 ANSWER 3 OF 12 MEDLINE on STN DUPLICATE 1
 AN 2005158610 IN-PROCESS
 DN PubMed ID: 15790578
 TI Engineering of a thioglycoligase: randomized mutagenesis of the acid-base
 residue leads to the identification of improved catalysts.
 AU Mullegger Johannes; Jahn Michael; Chen Hong-Ming; Warren R Antony J;
 Withers Stephen G
 CS Protein Engineering Network of Centres of Excellence, Department of
 Chemistry and Department of Microbiology, University of British Columbia,
 Vancouver, BC V6T 1Z1, Canada.
 SO Protein Eng Des Sel, (2005 Jan) 18 (1) 33-40.
 Journal code: 101186484. ISSN: 1741-0126.
 CY England: United Kingdom
 DT Journal; Article; (JOURNAL ARTICLE)
 LA English
 FS NONMEDLINE; IN-PROCESS; NONINDEXED; Priority Journals
 ED Entered STN: 20050326
 Last Updated on STN: 20050422

L3 ANSWER 4 OF 12 WPIDS COPYRIGHT 2005 THE THOMSON CORP on STN
 AN 2004-295085 [27] WPIDS
 DNC C2004-112898
 TI Novel mutant form of glycosidase enzyme obtained by mutating a glycosidase
 enzyme to replace a catalytically active amino acid with different amino
 acid, useful in synthesis of thioglycosides.
 DC B04 D16
 IN JAHN, M; WITHERS, S G
 PA (UYBR-N) UNIV BRITISH COLUMBIA
 CYC 106
 PI WO 2004024908 A1 20040325 (200427)* EN 36 C12N009-24
 RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS
 LU MC MW MZ NL OA PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW
 W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK
 DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
 KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG
 PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ
 VC VN YU ZA ZM ZW
 AU 2003266082 A1 20040430 (200462) C12N009-24
 ADT WO 2004024908 A1 WO 2003-CA1398 20030912; AU 2003266082 A1 AU 2003-266082
 20030912
 FDT AU 2003266082 A1 Based on WO 2004024908
 PRAI US 2002-410502P 20020912
 IC ICM C12N009-24
 ICS C12P019-64

L3 ANSWER 5 OF 12 MEDLINE on STN DUPLICATE 2
 AN 2004496603 MEDLINE
 DN PubMed ID: 15252054
 TI Directed evolution of a glycosynthase from Agrobacterium sp. increases its
 catalytic activity dramatically and expands its substrate repertoire.
 AU Kim Young-Wan; Lee Seung Seo; Warren R Antony J; Withers Stephen G
 CS Protein Engineering Network of Centres of Excellence of Canada, British
 Columbia, Canada.
 SO Journal of biological chemistry, (2004 Oct 8) 279 (41) 42787-93.
 Electronic Publication: 2004-07-13.
 Journal code: 2985121R. ISSN: 0021-9258.
 CY United States
 DT Journal; Article; (JOURNAL ARTICLE)
 LA English
 FS Priority Journals
 EM 200411
 ED Entered STN: 20041007
 Last Updated on STN: 20041219
 Entered Medline: 20041124

L3 ANSWER 6 OF 12 MEDLINE on STN DUPLICATE 3
 AN 2004039182 MEDLINE
 DN PubMed ID: 14740034
 TI Thioglycosynthases: double mutant glycosidases that serve as scaffolds for
 thioglycoside synthesis.
 AU Jahn Michael; Chen Hongming; Mullegger Johannes; Marles Jennifer; Warren R
 Antony J; Withers Stephen G

CS Department of Chemistry, University of British Columbia, 2036 Main Mall,
Vancouver, B.C. V6T 1Z1, Canada.
SO Chemical communications (Cambridge, England), (2004 Feb 7) (3) 274-5.
Electronic Publication: 2004-01-05.
Journal code: 9610838. ISSN: 1359-7345.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200405
ED Entered STN: 20040124
Last Updated on STN: 20040510
Entered Medline: 20040507

L3 ANSWER 7 OF 12 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
DUPLICATE 4
AN 2001-07440 BIOTECHDS
TI Enzymatic synthesis of carbon-fluorine bonds;
Agrobacterium sp. beta-glucosidase and Cellulomonas fimi
beta-mannosidase-catalyzed 2,4-dinitrophenyl beta-glycoside
halogenation for carbon-fluorine bond formation study
AU Zechel D L; Reid S P; Nashiru O; Mayer C; Stoll D; Jakeman D L; Warren R
A J; *Withers S G
CS Univ.British-Columbia
LO Protein Engineering Network of Centres of Excellence and Department of
Chemistry, University of British Columbia, Vancouver, British Columbia
V6T 1Z1, Canada.
Email: withers@chem.ubc.ca
SO J.Am.Chem.Soc.; (2001) 123, 18, 4350-51
CODEN: JACSAT ISSN: 0002-7863
DT Journal
LA English

L3 ANSWER 8 OF 12 MEDLINE on STN DUPLICATE 5
AN 2001267758 MEDLINE
DN PubMed ID: 11358691
TI Directed evolution of new glycosynthases from Agrobacterium
beta-glucosidase: a general screen to detect enzymes for oligosaccharide
synthesis.
AU Mayer C; Jakeman D L; Mah M; Karjala G; Gal L; Warren R A; Withers S G
CS Protein Engineering Network of Centres of Excellence of Canada, Department
of Chemistry, University of British Columbia, Vancouver.
SO Chemistry & biology, (2001 May) 8 (5) 437-43.
Journal code: 9500160. ISSN: 1074-5521.
CY England: United Kingdom
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200109
ED Entered STN: 20010917
Last Updated on STN: 20010917
Entered Medline: 20010913

L3 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:327102 HCAPLUS
TI Turbo-glycosynthases: Enhanced glycosylation activity obtained by
substituting serine at the nucleophile position in retaining glycosidases.
AU Zechel, David L.; Mayer, Christoph; Nashiru, Oyekanmi; Reid, Stephen P.;
Warren, R. Antony J.; Withers, Stephen G.
CS Department of Chemistry, University of British Columbia, Vancouver, BC,
V6T 1Z1, Can.
SO Book of Abstracts, 219th ACS National Meeting, San Francisco, CA, March
26-30, 2000 (2000), BIOL-061 Publisher: American Chemical Society,
Washington, D. C.
CODEN: 69CLAC
DT Conference; Meeting Abstract
LA English

L3 ANSWER 10 OF 12 MEDLINE on STN DUPLICATE 6
AN 2000115459 MEDLINE
DN PubMed ID: 10648808
TI The E358S mutant of Agrobacterium sp. beta-glucosidase is a greatly

improved glycosynthase.
AU Mayer C; Zechel D L; Reid S P; Warren R A; Withers S G
CS Protein Engineering Network of Centres of Excellence, Department of
Chemistry, University of British Columbia, Vancouver, B.C., Canada.
SO FEBS letters, (2000 Jan 21) 466 (1) 40-4.
Journal code: 0155157. ISSN: 0014-5793.
CY Netherlands
DT Journal; Article; (JOURNAL ARTICLE)
LA English
FS Priority Journals
EM 200002
ED Entered STN: 20000309
Last Updated on STN: 20000309
Entered Medline: 20000222

=> d 11-14

L3 ANSWER 11 OF 12 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on
STN
AN 2000:122871 BIOSIS
DN PREV200000122871
TI The E358S mutant of Agrobacterium sp. beta-glucosidase is a greatly
improved glycosynthase.
AU Mayer, Christoph; Zechel, David L.; Reid, Stephen P.; Warren, R. Antony
J.; Withers, Stephen G. [Reprint author]
CS Protein Engineering Network of Centres of Excellence, Department of
Chemistry, University of British Columbia, Vancouver, B.C., V6T 1Z1,
Canada
SO FEBS Letters, (Jan. 21, 2000) Vol. 469, No. 1, pp. 40-44. print.
CODEN: FEBLAL. ISSN: 0014-5793.
DT Article
LA English
ED Entered STN: 5 Apr 2000
Last Updated on STN: 3 Jan 2002

L3 ANSWER 12 OF 12 BIOTECHDS COPYRIGHT 2005 THE THOMSON CORP. on STN
AN 1995-03027 BIOTECHDS
TI Changing enzymatic reaction mechanisms by mutagenesis: conversion of a
retaining glucosidase to an inverting enzyme;
Agrobacterium faecalis retaining beta-glucosidase conversion to
inverting enzyme by enzyme engineering and point mutation; potential
use in oligosaccharide production
AU Wang Q; Graham R W; Trimbur D; Warren R A J; *Withers S G
CS Univ.British-Columbia
LO Department of Chemistry, University of British Columbia, 2036 Main Mall,
Vancouver, BC, V6T 1Z1 Canada.
Email: withers@unixg.ubc.ca
SO J.Am.Chem.Soc.; (1994) 116, 25, 11594-95
CODEN: JACSAT ISSN: 0002-7863
DT Journal
LA English

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(FILE 'HOME' ENTERED AT 12:46:14 ON 20 OCT 2005)

FILE 'MEDLINE, SCISEARCH, LIFESCI, BIOTECHDS, BIOSIS, EMBASE, HCAPLUS,
NTIS, ESBIODBASE, BIOTECHNO, WPIDS' ENTERED AT 12:46:46 ON 20 OCT 2005

L1 817 S (GLYCOSIDASE OR GLYCOSYL) (5A) (MUTA? OR VARIANT)
L2 41 S L1(5A) (RETAINING OR INVERTING)
L3 12 DUP REM L2 (29 DUPLICATES REMOVED)

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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	30.27	30.48

SESSION WILL BE HELD FOR 60 MINUTES

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